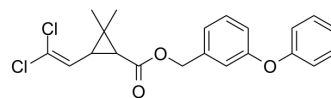


Permethrin

Cat. No.:	HY-B0887												
CAS No.:	52645-53-1												
Molecular Formula:	C ₂₁ H ₂₀ Cl ₂ O ₃												
Molecular Weight:	391.29												
Target:	Parasite; Mitochondrial Metabolism; Sodium Channel; Na ⁺ /K ⁺ ATPase												
Pathway:	Anti-infection; Metabolic Enzyme/Protease; Membrane Transporter/Ion Channel												
Storage:	<table border="0"> <tr> <td>Pure form</td> <td>-20°C</td> <td>3 years</td> </tr> <tr> <td></td> <td>4°C</td> <td>2 years</td> </tr> <tr> <td>In solvent</td> <td>-80°C</td> <td>6 months</td> </tr> <tr> <td></td> <td>-20°C</td> <td>1 month</td> </tr> </table>	Pure form	-20°C	3 years		4°C	2 years	In solvent	-80°C	6 months		-20°C	1 month
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SOLVENT & SOLUBILITY

In Vitro	DMSO : 50 mg/mL (127.78 mM; Need ultrasonic)																			
	<table border="1"> <thead> <tr> <th rowspan="2">Concentration</th> <th colspan="3">Mass</th> </tr> <tr> <th>1 mg</th> <th>5 mg</th> <th>10 mg</th> </tr> </thead> <tbody> <tr> <td>1 mM</td> <td>2.5556 mL</td> <td>12.7782 mL</td> <td>25.5565 mL</td> </tr> <tr> <td>5 mM</td> <td>0.5111 mL</td> <td>2.5556 mL</td> <td>5.1113 mL</td> </tr> <tr> <td>10 mM</td> <td>0.2556 mL</td> <td>1.2778 mL</td> <td>2.5556 mL</td> </tr> </tbody> </table>	Concentration	Mass			1 mg	5 mg	10 mg	1 mM	2.5556 mL	12.7782 mL	25.5565 mL	5 mM	0.5111 mL	2.5556 mL	5.1113 mL	10 mM	0.2556 mL	1.2778 mL	2.5556 mL
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Please refer to the solubility information to select the appropriate solvent.																				
In Vivo	<ol style="list-style-type: none"> Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline Solubility: ≥ 2.5 mg/mL (6.39 mM); Clear solution Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline) Solubility: 2.5 mg/mL (6.39 mM); Suspended solution; Need ultrasonic Add each solvent one by one: 10% DMSO >> 90% corn oil Solubility: ≥ 2.5 mg/mL (6.39 mM); Clear solution 																			

BIOLOGICAL ACTIVITY

Description	Permethrin (NRDC-143) is an insecticide, acaricide and a high selectively inhibitor of the Mitochondrial complex I, found in sediment and water samples. Permethrin shows estrogenic in vivo and anti-estrogenic activity in vitro. Permethrin also acts as a neurotoxin affecting neuron membranes by prolonging Sodium channel activation. Permethrin decreases resistance to bacterial infections in medaka (<i>Oryzias latipes</i>) ^{[1][2][3][4][5][6][7]} .
In Vitro	Permethrin (25 μM, 1 h) dose-dependently decreases the activity of total ATPase and the activity of Na ⁺ , K ⁺ -ATPase in vitro ^[5] .

MCE has not independently confirmed the accuracy of these methods. They are for reference only.

In Vivo

Permethrin (50, 500 and 5000 µg/kg BW, Dietary intake, daily for 12 weeks) promotes weight gain, total adipose tissue weight and aggravates high fat diet-induced insulin resistance along with high fat diet, but significantly decreases pAMPKα and pAMPKα/AMPKα expression in mouse^[1].

Permethrin (0.1, 1, 10 µg/L, aqueous solution, 14 days) has higher relative expression of choriogenin (Chg) than the 1 ng/L Ethinylestradiol (EE2) (HY-B0216) treatment, and lower relative expression than the 10 ng/L EE2 treatment in Juvenile *Menidia beryllina*^[6].

Permethrin (500 and 1000 mg/kg, diet mixed, daily for 14 days) has memory and spatial exploration dwindling effect, but no effects on anxiety and locomotion in rats^[7].

MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Animal Model:	Male C57BL/6J mice at three weeks of age ^[1]
Dosage:	50, 500 and 5000 µg/kg BW
Administration:	dietary intake with low and high fat diets, daily for 12 weeks
Result:	Significantly increased body weight gain in high fat diet-fed group by 56% in mice.
Animal Model:	Male Wistar rats weighing between 130-135 g ^[7]
Dosage:	500, 1000 mg/kg
Administration:	diet mixed with permethrin insecticide for 14 days
Result:	Induced the poorer the memory indices in all behavioral paradigms with high doses in rats.

CUSTOMER VALIDATION

- Brain Behav Immun. 2021 Jul 29;S0889-1591(21)00279-8.

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REFERENCES

- [1]. Shelley LK, et al. Immunotoxic and cytotoxic effects of atrazine, permethrin and piperonyl butoxide to rainbow trout following in vitro exposure[J]. Fish Shellfish Immunol. 2012 Aug;33(2):455-8.
- [2]. Gassner B, et al. The pyrethroids permethrin and cyhalothrin are potent inhibitors of the mitochondrial complex I[J]. Journal of Pharmacology and Experimental Therapeutics, 1997, 281(2): 855-860.
- [3]. Kakko I, et al. The synaptosomal membrane bound ATPase as a target for the neurotoxic effects of pyrethroids, permethrin and cypermethrin[J]. Chemosphere. 2003 May;51(6):475-80.
- [4]. Brander SM, et al. The in vivo estrogenic and in vitro anti-estrogenic activity of permethrin and bifenthrin. Environ Toxicol Chem. 2012 Dec;31(12):2848-55.
- [5]. Omotoso G, et al. Permethrin exposure affects neurobehavior and cellular characterization in rats' brain. Environ Anal Health Toxicol. 2020 Dec;35(4):e2020022-0.
- [6]. Xiao X, et al. Exposure to permethrin promotes high fat diet-induced weight gain and insulin resistance in male C57BL/6J mice. Food Chem Toxicol. 2018 Jan;111:405-416.

Caution: Product has not been fully validated for medical applications. For research use only.

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